to any great extent until a temperature of about 125° C. has been reached begins to distil. The distillation is continued until a temperature of about 180° C. is reached, when the fire is extinguished and the receiver with bromhydric acid detached. The retort and its contents are allowed to stand till cold, when a quantity of water equal to about one-third of the bulk of the contents is poured into the retort. Heat is then again applied and the distillation continued until the temperature in the retort has reached the same height as before. This second distillation serves to remove a portion of bromhydric acid which cannot be removed in the first distillation.

The phosphoric acid which forms the residue in the retort is a black syrupy liquid, which, however, after dilution with water, digestion with about half per cent of purified animal charcoal, and subsequent filtration through white filtering paper (best the brand known as "Chlorine Paper"), becomes perfectly colourless.

The black colour of the phosphoric acid is due to an organic impurity of the commercial Br, which, it is said, is derived from the luting of the stills, in the composition of which tar is used.

The bromhydric acid, which has distilled over, requires to be redistilled before it can be considered sufficiently pure for pharmaceutical purposes.

If the addition of Br is made to an acid, from which the arsenic has not been removed, the entire amount of arsenic will distil over with the bromhydric acid, while the phosphoric acid will be found free from arsenic.

Obituary.

WALTER WELDON, F.R.S.,

FORMERLY PRESIDENT OF THE SOCIETY OF CHEMICAL INDUSTRY.

Walter Weldon was the eldest son of a manufacturer at Loughborough, and was born on the 31st October, 1832. After having employed himself for some years in his father's works, he came to London, in the year 1854, and applied himself to literary pursuits. Of the labours and struggles of the following six years there is little to record. That they were sufficiently arduous and anxious we may well believe from our knowing little about them. They brought him assuredly neither name nor fame; and a writer who, in six years, shall have acquired in no measureable degree a literary reputation, can scarcely be supposed to have discovered prosperity either. Moreover, before coming to London, he had married a young lady of his own age (he was in his twenty-second year), Miss Anne Cotton, of a Derbyshire family. This imprudence, however, was certainly the wisest thing he had yet done, or was perhaps ever to do. Of the sustainment derived in those early days of discouragement and difficulty from the courage, energy, and devotion of his wife, he ever loved to speak; and it is only due to her memory,—for she too has passed away,—here to record it. During this period, he associated himself with the shareholders in a newspaper, proposed to be issued at this time under the title of *The Dial*, incorporated subsequently with the *Morning Star*, an influential Liberal London newspaper of that day. In furtherance of this project, he travelled through the provinces, making acquaintance with many of the country booksellers, who could not fail to be impressed by his energy, and frank and manly bearing. The connections thus established were soon to prove serviceable. He had, in his early years, experienced the need of some periodical, by which the scientific discoveries and movements of the day should be placed on record as they arose, in a popular form, and at a moderate price; and to the establishment of such a publication he now addressed himself. It was originally designed to be a monthly "Register" of all facts and occurrences relating to the progress of Science. But he perceived, or was advised, that a periodical addressed solely to persons interested in science, to be published at the low price needful to reach those for whose benefit he proposed it, was unlikely, in that day, to obtain adequate public support; and he therefore determined to associate with his records of scientific inventions and discoveries, a "register" also of the progress, from month to month, of Literature and Art. In order to give the country trade a personal interest in his project, he arranged that the publication should be issued by each bookseller in the country subscribing for a sufficient number of copies, *in his own name*. It was to be published monthly, and the price was sixpence. On the 1st August, 1860, appeared, in London, the first number of *Weldon's Register of Facts and Occurrences in Literature, Science, and Art.* Among some of the early papers in it, may be noticed one on Mr. Darwin's then recently published work on the "Origin of Species," written, I believe, by Mr. John Marshall. It was followed by others on "Building Stones, why they Decay;" "Recent Elementary Books on Geology," "Spectrum Analysis," "Philosophy of Earthquakes," "The Coal and Guano Dyes," etc., etc. Among the contributors of the more purely literary and artistic papers were Mr. Sala, Mr. Edmund Yates, Mr. Tegetmeier, Mr. Hollingshead, Mr. W. M. Rossetti, Mr. J. Hain Friswell, Mr. Percy Greg, and others who have since become more or less widely known by their writings.

The *Register* was continued for some three years, but it may be doubted whether, at any time, it secured commercial success. The price at which it was issued involved the necessity for a very large sale, and this probably it never attained. Finally, and fortunately for the world, it had to be abandoned.

Mr. Weldon then directed his attention, by what special inducements, at the moment, we possess no sufficient knowledge, to the subject of industrial chemistry. Brought up in the tenets of the school of Swedenborg, to which he was ever deeply attached, he had made the acquaintance of Mr. C. T. Hook, the well-known paper manufacturer of Snodland, near Rochester, who was also a Swedenborgian, and this may possibly have led him to direct his attention to the particular branch of industrial science to which, by "cheapening every sheet of paper in the world,"—to adopt the words in regard to his work of the eminent French chemist Dumas,—he was to be indebted for his fame as a discoverer and a benefactor of his race.

Arriving now at the commencement of Mr. Weldon's career as a technological as well as a scientific chemist, we find and are struck with the fact that in this career are displayed the marks of true inborn genius, genius of a kind peculiarly British, and which rose, as with Watt, Stephenson, and others, casting aside impediments and difficulties, to ordinary men insurmountable.

It has been said that genius only amounts to an immense capacity for hard work. No doubt, such a capacity must be present, and must be exerted to produce brilliant effects, but we believe that besides this, there are the special gift of an inspired soul, a fixed and ever-burning desire drawing towards that which is great or good, together with that of a clear mental vision, stimulating and calling into play the capacity for work which is given to every man, according to his physical condition.

Mr. Weldon, as we have seen, was not instructed, still less experienced, as a chemist, but rather as a writer and an editor of works of general literature. The time about which the *Weldon's Journal* was abandoned was the year 1863, and the nearest date to this at which any particulars are to hand relating to the transition period of his career, as it may be termed, is 1865.

In 1863, having reached what once appeared to him in a certain sense the goal of his modest aspirations and hopes, Weldon found, instead of pecuniary reward, pecuniary loss—*but*, he found besides, a new region with an apparently limitless horizon, for him almost without landmarks, and the paths of which when followed up gradually seemed to become mere tracks, these soon melting away to blend with the great unknown expanse before him. But, possessing genius, the new land, with what little he knew of it, presented irresistible fascination, and being further impelled by necessity, besides having the indomitable perseverance and courage of the true Briton, he explored the land, found his right path, and discovered eventually too that he had only missed his first goal to attain a higher: how much higher we are now to record.

Let us see how this is borne out. From some notes with which we have been favoured by Mr. John Spiller, we gather that in 1865 Walter Weldon was already engaged with the invention of certain chemical processes. On Monday, September 18, 1865, according to appointment, Mr. Spiller met Mr. Weldon with his friend Mr. Greg, for the purpose of hearing the details of these processes described in confidence, and of giving an opinion. The proposals referred to the manufacture of magnesium and aluminium by two new processes. For the first, Weldon proposed to heat together magnesia and iodide of sodium, whereby he obtained a double iodide, which was said to be easily decomposed by sodium, or even by lead, with production of metallic magnesium. The second suggestion was to flux cryolite with chloride of calcium, and to use this mixture as a source of aluminium, instead of the more expensive chloride demanded by Deville's process.

Col. Gamble, who next interested himself in Mr. Weldon's experiments, and at whose works in St. Helens the experiments leading to the foundation of the Weldon Process were actually wrought out and the process itself was adopted, has kindly supplied the following particulars in a letter:—"I cannot now remember," writes Col. Gamble, "by whose intervention I first knew Mr. Weldon, but our first meeting was in London in the latter part of 1866, when he repeated before me in my bedroom at the Tavistock Hotel, some experiments which he had made on the production of soda by the decomposition of common salt by hydrofluoric acid, and which I believe he had patented. My opinion of this process being unfavourable to its success, in the first instance on account of the impracticability of obtaining apparatus capable of resisting the action of the materials, he called my attention to some experiments he had made on the oxidation of protoxide of manganese by blowing air through it whilst suspended in water, by which he thought he had obtained a peroxide.

"At this time, he appears to have been totally unacquainted with quantitative chemical analysis, or the results to be obtained from it, and I informed him that his process had been worked on a large scale by Mr. Gossage at Stoke Prior in Worcestershire several years before, with the result of only obtaining a very light sesquioxide, which it was found was a very unsatisfactory material to work with in obtaining chlorine, and the process was therefore abandoned.

"I had a considerable number of experiments made at my laboratory in St. Helens, extending over a long period, most of the time under Mr. Weldon's supervision, when it was discovered that the presence of chloride of calcium and an excess of lime along with the protoxide to be oxidised, was necessary for the production of a higher oxide than sesquioxide. But our experiments did not lead us to what appeared to me a workable process. Sometime in 1867 Mr. Weldon discovered the magnesia manganese process, which he patented, and the experiments upon it, conducted on a manufacturing scale, delayed our progress with the lime process, which we did not get to work for making bleaching powder till sometime in 1868. In the meantime some experiments had been conducted by Mr. Weldon on the Tyne (I believe at the Walker Alkali Works), so it was not until sometime in 1869 that we worked the process on a manufacturing scale."

The extracts from Mr. Spiller's notes and Col. Gamble's letter may be usefully supplemented by the following, written by Mr. Weldon himself, and taken from the *Newcastle Chronicle* of July 5th, 1884:—"The first experiment, other than laboratory experiments, with what is now known as 'The Weldon Process,' were made at Walker, in the demolished works of the Walker Chemical Company, about the year 1866. After having reached a certain point the experiments at Walker were abandoned for various reasons. They were soon afterwards resumed at the works of Messrs. J. C. Gamble & Sons, at St. Helens, Lancashire, and it was there that the process was finally worked out."

It will be seen from the extract from Colonel Gamble's letter how much knowledge, as well as experience in theoretical and applied chemistry, Mr. Weldon had yet to acquire in 1866. The writer has before him a letter dated March 8th, 1883, acknowledging the receipt of an address on the subject of instruction in applied chemistry, in which he (the writer) had unwittingly referred to Mr. Weldon as "a trained chemist," in the ordinary sense of the term. The following is the extract of that letter bearing reference to the matter:—

"I have read with great interest your lecture," writes Mr. Weldon, "report of which you so kindly sent me recently, and I heartily agree with its general argument. But it was a mistake to quote me as an example of a 'trained chemist.' I never heard a chemical lecture in my life. Though few men were more intimately acquainted with the whole *literature* of chemistry, I had never entered a chemical laboratory, or seen a chemical experiment, when I patented, not Weldon's process as it is, but what *led* to it!"

This extract, coupled with the information given by Mr. Spiller and Col. Gamble, throws much light backwards, as it were, on the probable nature and direction of the toilsome reading and study which must have largely occupied nearly three years preceding 1865, and following the abandonment of the *Weldon's Journal* in 1863. It may be safely inferred that a large proportion, both of time and strength, was during this period devoted to the study of chemical literature.

If any man desire then to know what genius is, as well as what hard work may do, let him read first the extracts referring to 1865 and 1866, and secondly, let him read, if he had not the good fortune to hear, that Address delivered in 1884 at Newcastle-on-Tyne, at the close of Mr. Weldon's presidential year with the Society of Chemical Industry.

With regard to the discovery of the chemical reactions and their utilisation, which led to the great Weldon Process, we have a full description from Mr. Weldon's own pen in the last number of this Journal, page 525, as well as a foreshadowing of further problems for future working out, should life have been spared to him. Suffice it to say, that after many experiments with the object of recovering the manganese as peroxide, which had previously been lost as chloride in the liquors, run from the chlorine stills of the bleaching powder manufacturer, he at length succeeded in his design.

The manganese formerly lost was recovered to the extent of 90 to 95 per cent.; the price of bleaching powder was reduced by £6 per ton; its production was quadrupled, and something like £750,000 per annum were added to the national wealth. As M. Dumas, the great French chemist, observed in his address when presenting to him the gold medal of the Société d'Encouragement, "By Mr. Weldon's invention, every sheet of paper and every yard of calico has been cheapened throughout the world."

This was a notable achievement, and was recognised nowhere more cordially than in France. By the French Government Mr. Weldon was nominated Chevalier of the Legion of Honour, and he received, as we have said, from the Société d'Encouragement its great medal, conferred on only four other persons, Lesseps, Boussingault, Deville and Giffard. Nor did this great service to the cause of Industrial Chemistry pass unrecognised by the leaders of scientific thought in his own country, for on the 8th of June, 1882, Weldon was elected a Fellow of the Royal Society.

He was a man of prodigious energy and perseverance, coupled with knowledge of the world and capacity for business; and to these qualities was largely due the rapid and successful adoption of his invention. He spared no pains and neglected no details. Nor was his attention limited to his own invention. He had made himself more or less familiar with all branches of chemical industry, and in the alkali trade was regarded as an expert whose judgment was of the highest value.

He was a leader in the formation of the Society of Chemical Industry, the welfare and progress of which lay very near his heart. As President of that Society he delivered, as has been already mentioned, an address at Newcastle-on-Tyne in 1884, which excited extraordinary interest. Granted the correctness of all the premises, as a piece of scientific literature this is a perfect model of lucid reasoning, besides possessing, for writing of such a kind, a strange fascination for the reader.

To his scientific attainments he united, as may indeed be now inferred, singular literary skill; and there was not perhaps another man in England who could make a difficult matter more plain to people of ordinary intelligence, and this without the least sacrifice of accuracy or evasion of detail.

Mr. Weldon's earnest devotion to official duties during his presidentship of the Society of Chemical Industry in 1883-4, will probably never be forgotten by his colleagues, both of the Council and of the Publication Committee. But he went far beyond ordinary official duties in the self-sacrificing and generous attempt to attain to higher ideal standards set up within himself. It was sufficient for him that help was needed at some point, that someone was wanted, and that he had the ability to render the required assistance, not to justify merely, but to impel him to offer himself. Thus it came about that during his period of office as President, he sacrificed very largely both time and strength, as well as money, in the interests of the Society of Chemical Industry and its Journal. That these are no figures of speech merely, nothing is easier to prove. As one example among many: When abstracts of English patents were generally introduced into the Journal, and difficulty was at first found in getting these abstracts properly made, Mr. Weldon at once undertook the work himself, and for a considerable period the abstracts came in regularly, a considerable proportion of them in his own handwriting. In fact, all the unsigned abstracts appearing in the Journal about the first half of the year 1884, are his work. The following is an extract of a private letter received from him, by the writer, and dated March 1, 1884, with reference to the self-imposed task above referred to, the conscientious carrying out of which, to the very letter, will be sufficiently manifest, after a reference to the Journal and a perusal of some of these abstracts, which are models of their kind. "As regards myself," writes Mr. Weldon, towards the close of his presidential year, "the time the abstracts of patents occupy me is ruinous. Still, I shall not leave the Society in the lurch at any time, whether President or not."

Besides the vast labour and anxieties entailed by the writing, technological researches, etc., involved in the evolution and maintenance of the very numerous patents bearing his name, or taken out jointly with others, Mr. Weldon kept fully abreast with the advance of the inorganic portion of pure chemical science; and he occasionally contributed papers, which always contained something of original thought, and were always a pleasure to hear or to read. At the meetings of the British Association in Montreal last year, he contributed a paper on the "Periodic Law," and quite recently he had published for private circulation a work "On the Ratios, one to another, of the Atomic Weights of the Elements," Chapter I. This Chapter I. is devoted to "The Glucinum Family."

The idea of the simplicity of matter and the existence of a common element, is a very old one, and one that has been fondly nurtured by physicists of all ages. Prout's hypothesis partakes of the same nature; its unit is, however, arbitrary and suggestive of hydrogen as that common element. Weldon, in this his last work, accepts the relations between the elements in the Newlands-Mendeléléef series as expressive of a common typical structure; he then deduces from the atomic weights of the members of the series taken, a constant which admits of their expression in a relation to one another of a simple character. It is to be hoped that though deprived of his lucid reasoning, a continuation of this work may yet be possible, along the lines indicated in it.

Like so many in this strenuous generation, Mr. Weldon suffered from over-work. Never satisfied with what he had done, he entertained larger designs, labouring unremittingly for their development. Continually warned that the strain on his energies was excessive, he held on in weakness as in strength. For a long series of years he had attended the meetings of the British Association, and went to the recent gathering at Aberdeen, but only to discover that he was too unwell to take his accustomed share in the proceedings. To a friend meeting him as he was on the point of leaving town for Aberdeen, he said: "I am going to the British Association, though I am very unfit. I have never missed a year since my wife and I first attended the meetings, and I do not like to do so now; but it will be the last." He returned to his home, Rede Hall, Burstow, Surrey, on September 16th, and on the 18th wrote to a friend that he "had been ordered to do no work on pain of almost instant death," adding, with reference to some matters of urgency, "I shall do my best." Two days later his life struggle was over, terminating at the age of 53, of disease of the heart,—a career full of achievement, and with what seemed sure promise of yet greater success.

For the following notes on the personal qualities and characteristics of this distinguished man, as well as for those relating to his earlier and literary career, we are indebted to one of his oldest and most intimate friends, Mr. Alaric A. Watts:—

"I have not known," Mr. Watts writes, "any man in whom the intellectual and emotional elements in human nature were so harmoniously and happily married as in my friend. Each took its own place, and fulfilled its own special duties side by side, out of an abundant affluence of both; nor were their combined influences wanting. In him, as was justly remarked at his funeral by one of the friends of his later life, Mr. Alexander Chance, 'Science never operated to chill the heart.' He was generous to a fault; there was indeed in his nature something princely. He loved to make happy and to serve; and the eminently practical character of his imagination enabled him instinctively to seize occasions for doing so which, with the best intentions, might not have occurred to a less gifted nature. With him, benevolence needed no culture.

"The quality in his nature which I have described as 'princely' entered into all his actions, and was a necessary concomitant of all his surroundings. A man of the simplest personal habits and desires, there was nevertheless in him an expansiveness which delighted to surround itself with what was beautiful and grandiose—a certain largeness which made space and dignified environments a necessity of his being. There was nothing in him in any respect small or narrow. He 'dwelt ever in large places.' His address and deportment to all persons was frank and cordial; gentle, and, when the occasion demanded it, instinct with a modest and gracious dignity that was extremely engaging. He possessed much tact and delicacy of feeling, associated ever with entire sincerity and truthfulness, and a firm and resolute will. He was endowed, in a remarkable degree, with that capacity for taking pains which a high authority assures us is the invariable accompaniment of true genius, if indeed it does not constitute it. No matter, either of business or otherwise, with him was so insignificant as to be dealt with otherwise than in the most complete and perfect way within his knowledge and power. A radical in the true and only real sense of the term, he penetrated ever to the root of things, and was thorough in whatsoever he set his hand to. Notwithstanding the arduous and incessant labours of his life, he found time, either in the early morning or in the watches of the night—which his persistent activity of brain rendered too frequent,—to keep himself fairly abreast of the miscellaneous literature of the day, supplying himself with whatever was of genuine excellence in all its branches. He was no patron of circulating libraries, caring little to read a book not worth buying. But his supreme delight was in his garden and pleasure grounds, in the construction and development of which he spent all that he could spare of his time, and possibly, sometimes, more than he could spare of his money.

"As a companion he was cheerful and genial, and eminently sympathetic—not insensible to the charms of light humour, but more instinctively attracted to what was pathetic and of noble sentiment. I cannot conceive the possibility of anything base or unseemly being uttered in his presence. Care had accompanied his march to fame, and sorrow with him was not lacking to temper the heats of prosperity. The loss of one of his sons, a bright and engaging young man, followed soon after by that of his wife, to whom he was tenderly attached, and for whose gratification to him prosperity was mainly valuable, affected with a tender melancholy the later years of his life. Moreover, during all his life he was more or less a sufferer physically. His nerves were too finely strung for much of the work he had to perform, and though in his later years of a robust and vigorous frame and aspect, —some who read these words may recall the terrors of the grip of his strenuous hand,—his physical strength was not always answerable to the heavy demands made upon it by the energy of his will and his almost morbid sense of duty. He suffered at intervals from violent attacks of neuralgia or brow ague; and the long journeys which he was compelled so frequently to take on the Continent and elsewhere on the affairs of his company and otherwise, were well calculated, by accelerating the action of the heart, to induce the disorder to which he was ultimately to succumb. His interest in the present and his hopes in the future were, however, happily kept alive by his elder son and the present representative of his family, Mr. W. F. R. Weldon, M.A., of St. John's College, Cambridge, and Lecturer on Invertebrate Morphology at that University, married, in 1883, to the eldest daughter of his friend, Mr. William Tebb, of Albert Road, Regent's Park.

"Those who take interest in such matters may care to know that, though perturbing his mind little with party politics, Mr. Weldon was a staunch adherent of Mr. Gladstone. In religious belief, he was a Christian of the Swedenborgian type. These latter views and sympathies led him early to take an interest in the phenomena of modern spiritualism, which he had carefully investigated and in which he believed.

"A short time before his death, the writer received a letter from him, with the concluding paragraph of which he may be allowed to terminate these imperfect notes. 'The last time,' he said, 'I walked in my garden with my dear wife, I noticed, early as it was, the leaves on a certain tree turning brown. We were of course thinking of Dante[*]. I quoted to her these lines from verses of our poor friend Spencer Hall[†]:—

"'The Autumn days are come again,
The hedges redden in the lane,
The leaves are golden on the tree,
And golden memories bloom in me.'"

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[*] His younger son, then recently deceased.

[†] We had met first at this gentleman's house.

London Section.

CHEMICAL SOCIETY'S ROOMS, BURLINGTON HOUSE.

Chairman: David Howard.

Committee:

Sir F. A. Abel.
H. E. Armstrong.
W. Lant Carpenter.
W. Crowder.
C. Graham.
S. Hall.
A. K. Huntington.
R. Messel.
B. E. R. Newlands.
B. Redwood.
T. Royle.
John Spiller.
G. C. Trewby.
J. Williams.

Local Sec. and Treasurer: Thos. Tyrer,
Garden Wharf, Church Road, Battersea, S.W.

MEETINGS, SESSION 1885—86.—First Monday in each month (unless otherwise indicated).

SPECIAL MEETING.

October 26.—Mr. Frederick Siemens, being in London, will attend the discussion of his Paper read at the last Annual Meeting, "On Heating Regenerative Gas Furnaces by Radiation from Flame, and on Producers to supply Gas specially Suitable for that purpose, and for the Recovery of By-Products."—(See Journal for July, 1885, pp. 4—39.)

ORDINARY MEETINGS.

First Monday in the Month, at 8 p.m.

November 2.—Dr. C. R. A. Wright, F.R.S., and Mr. C. Thompson—"Notes on the Chemistry of Soap." Mr. V. H. Veley—"On the Lime Process for the Purification of Coal Gas."

December 7.—Dr. P. F. Frankland on "Some Aspects of Filtration and other Methods of Water Treatment." Dr. F. L. Teed—"Note on the action of Calcium Carbonate on Solution of Ammonium Chloride."

January 4, 1886.—Mr. G. E. Davis—"On the Enrichment of Coal Gas by certain Hydrocarbons." Mr. C. T. Kingzett—"Notes on Russian Turpentine."

February 1.—Mr. Gustav Bischof—"Notes on Dr. Koch's Water Test." Mr. J. W. Westmorland—"The Estimation and Valuation of Copper Ores and Products for Commercial Purposes."

March 1.—Mr. Boverton Redwood—"Researches on Viscosity."

April 5.—

May 3.—Messrs. Macnab and Beckett—"The Treatment of Water for Technical Purposes."

June 7.—Dr. Meymott Tidy—"Chemical Treatment of Sewage."

July.—Annual Meeting at Liverpool.

Notices of papers and communications for the meetings to be sent to the Local Secretary.

Manchester Section.

Chairman: Sir H. E. Roscoe.

Vice-Chairman: I. Levinstein.

Committee:

R. F. Carpenter.
C. Estcourt.
H. Grimshaw.
B. W. Gerland.
Peter Hart.
T. Jackson.
D. B. Hewitt.
C. Schorlemmer.
Watson Smith.
L. Siebold.
Wm. Thomson.
D. Watson.

Local Secretary:
J. Carter-Bell, Bankfield, The Cliff, Higher Broughton, Manchester.

MEETINGS, SESSION 1885—86.—First Tuesday in each Month, at 7 P.M.

November 3.—W. Thomson—"Indiarubber and its Decay." Dr. B. Gerland—"Potassium Antimony Oxalate." G. E. Davis—"The Valuation of Crude Naphthas of Commerce."

December 1.—A. H. Allen—"Further Notes on the Chemistry and Analytical Examination of Fixed Oils." Watson Smith—"The Violet Stains appearing on Sized Cotton Cloth" (*Experimentally Illustrated*).

Notices of papers and communications for the meetings to be sent to the Local Secretary.

Journal and Patent Literature.

I.—GENERAL PLANT, APPARATUS, AND MACHINERY.

Improvements in the Production of a Compressed Gaseous Compound, for use in Gas Motors and for other purposes, and in Apparatus therefor. Emil Capitaine and Oscar Brünler, Berlin. Eng. Pat. 7581, June 22, 1885.

A SUITABLE liquid hydrocarbon is forced into a strong closed vessel to which heat is applied. The vapours evolved are allowed to escape under great pressure to a properly constructed receiver, passing on their way through an injector-like apparatus whereby sufficient air for combustion is drawn in and mingled with the vapours. This gaseous mixture is ready for explosion in the cylinders of gas engines, and is to be so admitted that the fresh charge expels the spent gases from the cylinder.
—A. R. D.

II.—FUEL, GAS, AND LIGHT.

Improvements in the Manufacture of Gas. J. Quaglio. Chem. Zeit. **9**, 959.

REFERRING to Fahnehjelm's invention, the author considers that an important step in the progress of the gas